Gender, Language, and the Goblet of Fire

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Gender of Spanish nouns and of characters out of the Harry Potter story

For languages like Spanish, French, German or Russian, grammatical gender of nouns is almost completely independent on natural gender of corresponding referents. Nevertheless, children acquire grammatical gender within their mother tongue quite early (Karmiloff-Smith, 1979; Pérez, 1990). Accordingly, Spanish and French children successfully use phonological cues at a very early stage for choosing the correct article independent from language external cues, such as the semantic category of the corresponding referent (Pérez, 1990).

In contrast, relying on natural gender of referents can be a promising strategy for adult L2 learners for choosing the article of unknown words given no other information or priming a known rule. So Larrañaga (2006) demonstrated that adult English learners of Spanish chose the correct article for invented Spanish nouns more often when they were accompanied by matching pictures (male – male picture name pairs, *mm*, or female – female pairs, *ff*) than if they was accompanied by mismatching pictures (male – female pairs, *mf*, or female – male pairs, *fm*).

That effect could be explained either by a semantic influence or simply by transferring the almost perfect correlation between grammatical gender of pronouns and natural gender of referents from English to Spanish. The later could be ruled out either by recruiting other participants (e.g., Larrañaga, 2006) or by using a completely different domain with a comparable task: So we used natural gender ratings for secondary characters out of the Harry Potter study for evaluating more in detail the semantic effect on this kind of rating (Brunstein & Larrañaga, 2005).

For about 180 participants rating 70 characters in a web experiment (www.tu-chemnitz.de/project/elearning/potter_english), we found comparable results as for the Spanish study: Participants rated e.g. male – male name picture pairs (matching, *mm*) much more often as male than male – neutral (*mn*) or male – female pairs (mismatching, *mf*). This effect fits nicely with our ACT-R model (R = .99) integrating presented pictorial and verbal information for the rating. This model recalls gender information for known names and pictures after encoding and finds an answer by integrating both sources of information. Given an unknown name or picture, the model answers are based on the known stimulus. Given no available information at all, the model would guess the gender of the presented character.

Alternatively to integrating both sources of information, participants could either *guess* right from the beginning, or *ignore systematically either the picture or the name*. The later would correspond with the findings for children learning the grammatical gender in their mother tongue (Karmiloff-Smith, 1979; Perez, 1990).

Versions of the model either *ignoring picture* (R = .47) or *guessing* (R = .09) fit less than the original *integrating* version (R = .99) with the pattern in the Harry Potter web experiment. In contrast, the version *ignoring names* (R = .95) fits nearly as good with these data as the *integrating* version. In addition, all of these versions could be candidates for explaining ratings of individual participants in a follow-up eye-tracking study.

So we expected for *integrating* both sources of information (identified by the ratings of participants) that they would spend attention on both names and pictures for rating the gender for all presented characters. They also should spend more time for rating mismatching pairs than for rating matching pairs.

In contrast, participants identified as *ignoring either names or pictures* should spend attention only on the preferred source of information for both matching pairs and mismatching pairs requiring the same amount of time for both ratings. For neutral pictures, participants ignoring names should spend more time looking at the picture and additional time on looking at the name.

Participants identified as *guessing* should look neither at pictures nor at names for all combinations of names and pictures.

Method

Ten students (8 women and 2 men, M = 24 years, SE = 1.5 years) of Chemnitz University of Technology, Germany, participated in this study for altogether 10 min in single sessions. Most of them (N = 8) did not read the Harry Potter story, but watched at least one of the movies (N = 7). The material and procedure was exactly the same as for the web experiment.

Results

Participants' ratings for name picture pairs correspond quite well with the original web experiment (R = .94),

especially for matching pairs (see figure 1). Once again, we found a strong effect of pictures indicating that participants rated male pictures more often as male. There was a bias to answer more often "female" for neutral pictures (*mn* and *fn*) and to answer by picture only for mismatching pairs (*mf* and *fm*, see figure 1). Participants spent more time for answer pairs with neutral pictures (M = 2371 ms, SD = 1703.0 ms) than for answering both pairs with male (M = 1557 ms, SD = 756.7 ms) or female pictures (M = 1519 ms, SD = 695.4 ms). However, there was no difference between matching / mismatching pairs and pairs with neutral pictures.

This pattern fits best with the ignore-names strategy for all 10 participants (R = .99) and integrating strategy (R = .92). Corresponding, participants' fixations are more often in the picture region (M = 33.5 %, SE = 3.9 %) than in the name region (M = 8.6 %, SE = 2.1 %), t (9) = 6.07, p < .001.

Table 1: Percentage of "male"-answers for name picture pairs in the web experiment, the eye-tracking study, and the four versions of the model.

Study	mm	mn	mf	fm	fn	ff
Web study	.98	.89	.33	.83	.34	.05
ET study	.98	.73	.00	1.0	.17	.03
Integrate	1.0	.75	.28	.70	.23	.00
Ignore-name	1.0	.75	.00	1.0	.25	.00
Ignore-picture	1.0	1.0	1.0	.00	.00	.00
Guessing	.50	.49	.51	.52	.49	.50

Discussion

Altogether the ignore-names strategy seems to explain best the pattern found in the Harry Potter eye-tracking study by assuming that participants base their rating whether a presented character is a boy or a girl mainly on the presented picture. Only if the picture contains no gender information the name seems to be taken into consideration for answering.

However, fixations in the name region are relatively long given 9 out of 27 neutral pictures and relatively short processing times for names compared to processing times for. Therefore, a strong version of the ignore-names strategy seems to be not probable neither for the eye-tracking study nor for the web experiment or the Spanish study.

For the Spanish study, this could mean that learners try most of the time to ignore the irrelevant picture illustrating the noun. However, they seem to be distracted in worst case and primed in best case by pictures for choosing the correct article for a given noun. That could also be interpreted as an influence of semantics in addition to pure transfer effects of their English mother tongue to Spanish.

That corresponds with evidence (Harris, 1991; Roca, 1989) for choosing articles for unknown nouns is based not exclusively on phonological rules. In contrast to Harris (1991) and Roca (1989), our results imply that learners' performance should be not at random level, but is triggered by accompanying pictures.

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